

A new subspecies of *Argynnis paphia* (LINNAEUS, 1758) from Ferghana

(Lepidoptera, Nymphalidae)

by

SERGEI V. CHURKIN & VLADIMIR A. PLETNEV

received 11.X.2011

Summary: A new subspecies, *Argynnis paphia angustia* subspec. nov. [TL: Kyrgyzstan, Ferghansky Mts. (west. edges), W. Urum-Bash river] is described. The new taxon inhabits the Tianshanian borders of Ferghana valley and well differs from other subspecies in the small but constant distinctions of the upperside black pattern and postdiscal silver band, interrupted in the middle.

Резюме: В статье описан новый подвид *Argynnis paphia angustia* subspec. nov. [Киргизия, Ферганский хр. (западный макросклон), река Зап. Урум-Баш]. Новый таксон населяет склоны Тянь-Шаня, прилегающие к Ферганской долине и хорошо отличается от других подвидов небольшими, но постоянными различиями в черном рисунке верхней стороны крыльев, а так же прерванной посередине серебрянной полосой на исподе.

Introduction: At the first look, *Argynnis paphia* (LINNAEUS, 1758) is a well-known species; however, the records from Russian Central Asia are nearly absent. Practically all of them belong to North Tian-Shan, Zailisky or Kungei Alatau; rarely to Kyrgyzsky Range and Terskey Alatau. TOROPOV & ZHDANKO (2009) published a map with many points from the mountains, bordering Ferghana Valley, but these points are not fully reliable as the authors have not studied the material from these localities by their own. Only one confirmed record for Ferghana was published by TSHIKOLOVETS (2005, plate 94: 8-10): 3 specimens originating from the western slopes of Ferghansky Range. All of them were collected by V. TSHIKOLOVETS personally; the late date and quality of the specimens show that the series was not in a good condition and includes mostly ♀. Evidently, nobody has seriously compared the material from different parts of Kyrgyzstan with other known taxa of *A. paphia* (L.).

Even a short study of the Ferghanian specimens confirmed their habitual dissimilarity to the relatives - however, we waited for many years: it was necessary to have large series and material from different localities and different years to be sure about the status of the macropopulation.

We collected *A. paphia* (L.) in several places at the northern (Bosbu-Too range, Baubash-Ata range) and eastern margins (Ferghansky range) of Ferghana valley - all of them were identical and had small but obvious and constant distinctions. It is not possible to confuse these butterflies with the individuals from Europe, Uras, Siberia or even Issyk-Kul Lake.

The holotype and part of the paratypes of the new taxon will be deposited in the Darwin State Museum (Moscow). Other paratypes are in the authors' collections.

Abbreviations: FW - fore wing, HW - hind wing, TL - type locality.

Argynnis paphia angustia subspec.nov.

Holotype ♂ (figs. 6, 7, 8, 11, 13): Kyrgyzstan, Ferghansky Mts. (west. edges), W.Urum-Bash R., Arkhangel'skoye v., 1600 m, 12.07.2011, S. CHURKIN leg.

Paratypes: 42 ♂♂, 29 ♀♀, same data, S. CHURKIN, V. PLETNEV leg.; 1 ♂, 1 ♀, Kyrgyzstan, Ferghansky Mts., Kek-Art R., 15 km E Kalmak-Krchin v., 2200-2300 m, 3.07.2006, S. CHURKIN leg.

Note: The butterflies from North Tian-Shan are usually treated as *A. paphia paphia* L. (LUKHTANOV & LUKHTANOV, 1994). Worth to note that Tuzov proposed two different systems for the species: it includes many subspecies according to the "Guide to the butterflies of Russia and adjacent territories" (where he used several invalid subspecific names) and just a few subspecies according to the "Guide to the butterflies of the Palearctic region. Nymphalidae. Part I. Tribe Argynnini" (Tuzov et al., 2000; Tuzov, 2003). In both cases no subspecific name for the Kyrgyzyan populations was proposed.

Our study leads to some important conclusions: the butterflies from South Urals, Saur, Dzhungaria, North Tian-Shan, Novosibirsk, Altai, Sayan and North Mongolia seem to be identical and definitely differ from the European material in the small and thin silver discal spot at the costal side of the HW underside. This character is slightly variable but absolutely useful and correlates with some other correspondent differences. We have not found any expressed cline inside the region as well as in the neighbouring part of European Russia, in contrast to the opinion of Tuzov (2003) that wide permanent clines exist in the distribution area. Of course, for such a common butterfly some clines must be developed but Tuzov's point of view in general does not correspond to the historical and zoogeographical knowledge. We suppose that it is simply based on the absence of a detailed study of the characters. Important to remember, that the DNA-study often confirms the differences existing between the population from the Urals and the Russian plain even for very common taxa.

Unexpectedly, we have not found any available name for the populations occupying the giant territory mentioned above. The name *pusilla* WNUKOWSKY, 1927 was given to an aberration, while *butleri* KRULIKOWSKY, 1909 usually has been applied to the northern macropopulation of *A. paphia* (L.) - the study of the type material is out of the limit of the present paper. All other available names belong to the populations from the Far East, China or western Europe/North Africa. It seems that this taxon has never been described, but its distribution area is contiguous to the area of the subspecies described below.

Description and diagnosis:

♂: FW length 33 mm in the holotype and 32 - 35 mm in the paratypes (i.e. the size is nearly the same as in European Russia but obviously more than in North Tian-Shan, East Kazakhstan or Urals and Altai where the FW length is 29-33 mm in the ♂♂).

The ground colour of the upperside and general pattern are typical for the species. The row of small blackish spots at the FW margins is reduced, small or absent [other representatives of *A. paphia* (L.) have this row more developed but only statistically]. At the same time, the black pattern as a whole is slightly enlarged, the spots are slightly stretched; this is more clearly seen on the FW underside. All sexual brands are more developed and thicker than in the ♂ from North Tian-Shan, East Kazakhstan and Altai, but we have not examined the androconial scales.

The main and unique upperside distinction is the position of the postdiscal black spot situated between M3 and Cu1. In all known subspecies of *A. paphia* (L.) this spot is placed in the central position between the spot M2-M3 and the discal spot situated at the end of the cell. Moreover, the males from Kazakhstan and Urals usually have the spot M3-Cu1 shifted towards the discal spot (see colour plate). On the contrary, in the ♂ of the new subspecies the spot M3-Cu1 is shifted to the spot M2-M3. This character is even more distinct on the underside of the FW; we have found no exceptions. Very rarely the specimens from North Tian-Shan demonstrate an intermediate position of this spot (we have such a ♂ from Kungei Alatau and one more ♂ from Terskey Alatau, Kere-Getash loc.). In addition, the M3-Cu1 spot is often drop-shaped and is always distinctly rotated clockwise, while in all other taxa it is always rectangular and not rotated (or even rotated anti-clockwise).

HW underside often greenish, but sometimes yellowish - the main colour does not present distinctions of a taxonomical value. The degree of the contrast of the underside is more important (in the new taxon the underside is always contrasting) but can not be a subspecific distinction according to the variability observed in the European and Siberian material.

The most important character is the size of the first silver spot of the discal row (situated at the costal side) - this spot is enlarged and thick, even thicker than in *A. paphia* (L.) from the European Russia. The butterflies from North Tian-Shan, Kazakhstan, Altai and Siberia have this spot twice thinner than the postdiscal spot.

HW underside postdiscal silver band is abruptly narrowed near the cell, so that the silver spots between M3-Cu and Cu1-Cu2 are practically absent - in all other taxa these spots are more or less developed, except rare aberrations. In addition, the inner bordering line of the silver band is very contrasting here, thick and has deep violet colour (such a violet colouration is a character of the species but never so expressed in other Eurasian populations).

♂ genitalia: Very similar to those of other taxa (we compared it with the material from Moscow, Brjansk, South Urals, Altai, Dzhungaria and Terskey Alatau) but the process of the valva has definitely smaller and thinner teeth.

♀: FW length 33-38 mm. The upperside pattern has the same distinctions as in the ♂, but shifting of the M3-Cu1 spot is not so obvious because this spot is enlarged (sexual dimorphism). On the other side, the whole pattern is also enlarged and the spots are mostly stretched as compared to the neighbouring taxa; it results in a quite different appearance of the butterflies (the ♀ habitually are more different from other subspecies while the characters themselves are not so distinctive as in ♂!).

The underside characters are the same but the distinctions are less expressed because the full width of the silver bands is wider than in the ♂.

No dark form of the ♀ (f. *valesina*) has been found so far.

Distribution: Tianshanian slopes bordering Ferghana valley (material from Bosbu-Too and Baubash-Ata was not included into the type series because of the bad condition of the specimens). TSHIKOLOVETS (2005) published one record from Chatkal valley - we suppose that West Tian-Shan is populated by *A. p. angustia* subspec.nov. North Tian-Shan must be included into the areal of the Uralian-Siberian taxon, while the specimens from Inner Tian-Shan and Alai are not known; i.e. the new subspecies populates the most southern part of the known areal in Central Asia.

The genetic exchange between the Ferganian populations and other taxa is possible only using the long way through West Tian-Shan - Talass valley - the western part of Kyrgyzsky range. The western edges of Kyrgyzsky range are too hot and dry, so that this way seems to be almost as long as difficult. This is a true base for isolation. The same is true for many species penetrating Central Asia from North Palaearctic, the representatives from the North Tian-Shan are usually similar to the European or Siberian (depending on the case) taxa, while Ferghana (and/or Inner Tian-Shan) is populated by a local subspecies.

Biology: The butterflies fly in the bushes or hazel forests around small springs; 1700-2200 m.a.s.l. Local. As a rule, not numerous - 2011 was the only year with large numbers of this species during many years of study.

Etymology: Angustia (Latin) - a narrow gorge, narrow limits.

Acknowledgements: We are much indebted to SERGEI SALUK (Minsk) and ERMEK URKUMBAEV (Kyrgyzstan, Oktjabr'skoye) for the help in the expeditions. Special thanks to ALEXEY DEVYATKIN for the help in preparation of the English version of this article.

References

LUKHTANOV, V. & A. LUKHTANOV (1994): Die Tagfalter Nordwestasiens (Lepidoptera, Diurna). - *Herbipoliana* **3**, Verlag Eitschberger, Marktleuthen.

TOROPOV, S. A. & A. B. ZHDANKO (2009): The butterflies (Lepidoptera, Papilionoidea) of Dzhungar, Tien Shan, Alai and Eastern Pamirs **2**. Danaidae, Nymphalidae, Libytheidae, Riodinidae, Lycaenidae. - Bishkek.

TUZOV, V. K., BOGDANOV, P. V., DEVYATKIN, A. L., KAABAK, L. V., KOROLEV, V. A., MURZIN, V. S., SAMODUROV, G. D. & V. A. TARASOV (2000): Guide to the butterflies of Russia and adjacent territories **1**. - Pensoft, Sofia-Moscow.

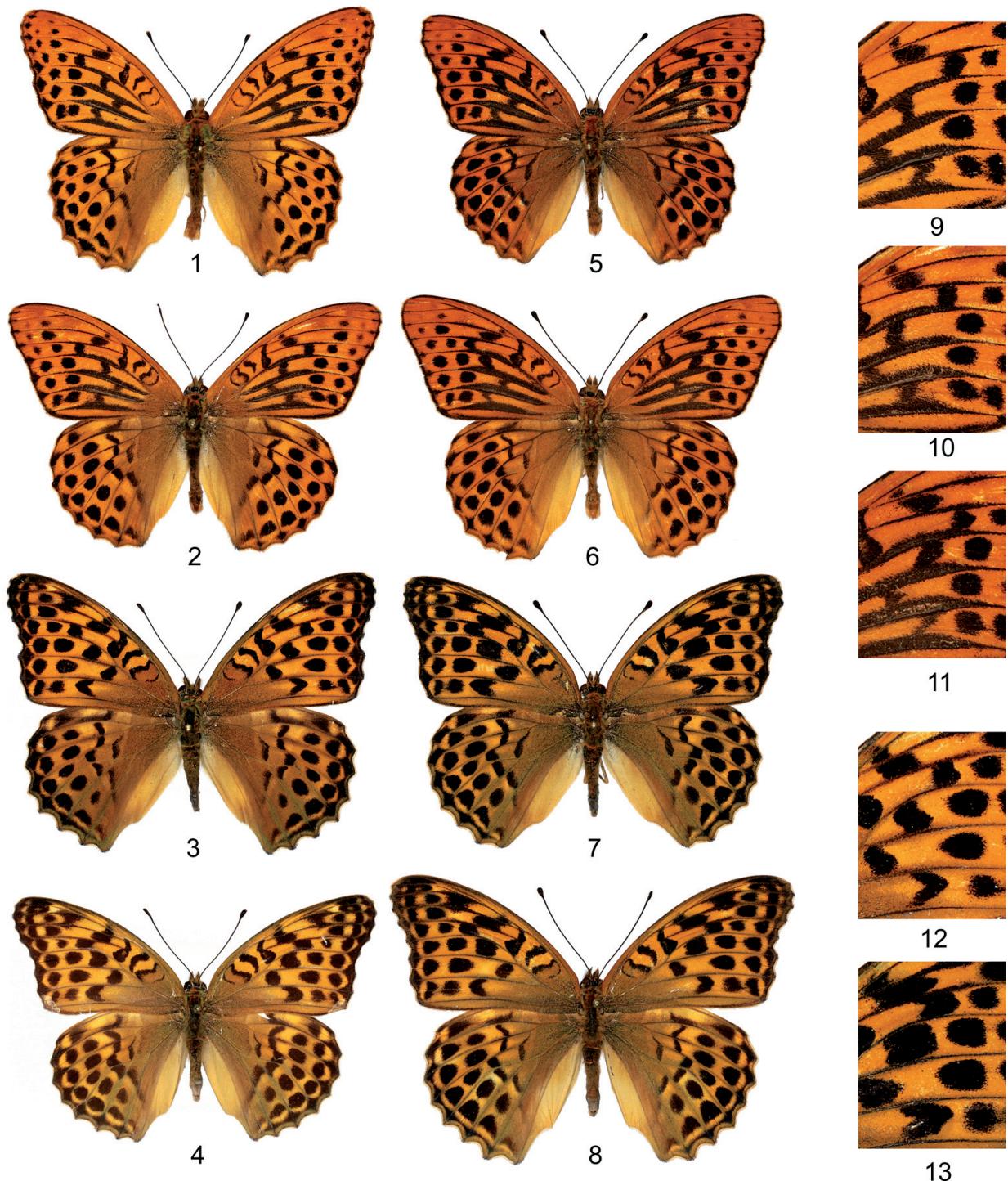
TUZOV, V. K. (2003): Guide to the butterflies of the Palearctic region. Nymphalidae. Part I. Tribe Argynnini. - Omnes Artes, Milano.

TSHIKOLOVETS, V. V. (2005): Butterflies of Kyrgyzstan. - Brno-Kyiv.

Addresses of the authors

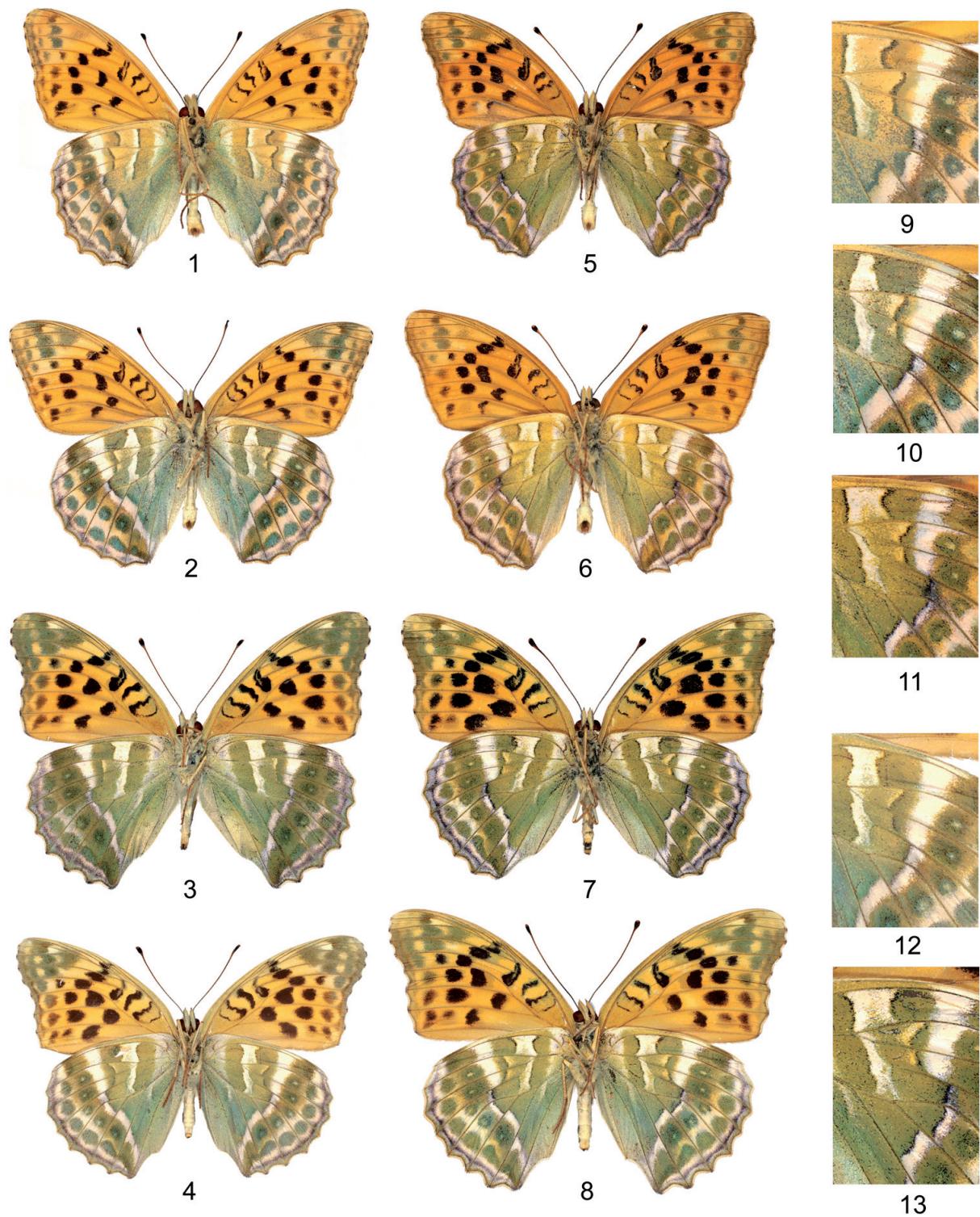
SERGEI V. CHURKIN
Jubileinyi pr., 14-168
Reutov, 143952, Moscow reg., Russia
serghelios2007@yahoo.com

VLADIMIR A. PLETNEV
All-Russian Institute of Plant Protection
Chemicals,
Ugreshskaya str. 31, Moscow, 115088,
Russia



Colour plate 1 (upperside)

- 1: *Argynnis paphia paphia* (LINNAEUS, 1758), ♂, Russia, Brjansk reg., Poluzh'e v., 3.07.2008, A. ANISKOVICH leg.
- 2: *Argynnis paphia* ssp., ♂, Kazakhstan, Dzhungaria, Burchansarytau Mts., 1500-1600 m, 21.06.2008, RUBIN N. leg.
- 3: *Argynnis paphia paphia paphia* (LINNAEUS, 1758), ♀, same data as 1.
- 4: *Argynnis paphia* ssp., ♀, same data as 2.
- 5: *Argynnis paphia angustia* subsp. nov., holotype ♂, Kyrgyzstan, Ferghansky Mts. (west. edges), W.Urum-Bash R., Arkhangel'skoye v., 1600 m, 12.07.2011, S. CHURKIN leg.
- 6, 7: *Argynnis paphia angustia* subsp. nov., paratypes (♂ and ♀), same data as 5.
- 8: *Argynnis paphia angustia* subsp. nov., paratype ♀, Kyrgyzstan, Ferghansky Mts., Kek-Art R., 15 km E Kalmak-Krchin v., 2200-2300m, 3.07.2006, S. CHURKIN leg.
- 9: *Argynnis paphia paphia paphia* (LINNAEUS, 1758), ♂ of fig. 1, forewing, part.
- 10: *Argynnis paphia* ssp., ♂ of fig. 2, forewing, part.
- 11: *Argynnis paphia angustia* subsp. nov., holotype ♂, forewing, part.
- 12: *Argynnis paphia paphia paphia* (LINNAEUS, 1758), ♀ of fig. 3, forewing, part.
- 13: *Argynnis paphia angustia* subsp. nov., paratype ♀ of fig. 6, forewing, part.



Colour plate 2 (underside)

- 1: *Argynnis paphia paphia* (LINNAEUS, 1758), ♂, Russia, Brjansk reg., Poluzh'e v., 3.07.2008, A. ANISKOVICH leg.
- 2: *Argynnis paphia* ssp., ♂, Kazakhstan, Dzhungaria, Burchansarytau Mts., 1500-1600 m, 21.06.2008, RUBIN N. leg.
- 3: *Argynnis paphia paphia* (LINNAEUS, 1758), ♀, same data as 1.
- 4: *Argynnis paphia* ssp., ♀, same data as 2.
- 5: *Argynnis paphia angustia* subspec.nov., holotype ♂, Kyrgyzstan, Ferghansky Mts. (west. edges), W.Urum-Bash R., Arkhangel'skoye v., 1600 m, 12.07.2011, S. CHURKIN leg.
- 6, 7: *Argynnis paphia angustia* subspec.nov., paratypes (♂ and ♀), same data as 5.
- 8: *Argynnis paphia angustia* subspec.nov., paratype ♀, Kyrgyzstan, Ferghansky Mts., Kek-Art R., 15 km E Kalmak-Krchin v., 2200-2300m, 3.07.2006, S. CHURKIN leg.
- 9: *Argynnis paphia paphia* (LINNAEUS, 1758), ♂ of fig. 1, forewing, part.
- 10: *Argynnis paphia* ssp., ♂ of fig. 2, forewing, part.
- 11: *Argynnis paphia angustia* subspec.nov., holotype ♂, forewing, part.
- 12: *Argynnis paphia paphia* (LINNAEUS, 1758), ♀ of fig. 3, forewing, part.
- 13: *Argynnis paphia angustia* subspec.nov., paratype ♀ of fig. 6, forewing, part.